

Thursday Morning, December 7, 1989

The Thursday morning session convened at 8:00 a.m. with Leonard P. Stoltz serving as Moderator.

IMPLICATIONS OF WATER RECYCLING

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During the decade of the 1990's water recycling may no longer be an option due to a public attitude that is developing on environmental issues. The implications of *not* recycling irrigation water may become the more important issue. Water recycling in a primitive form began when the first creatures on earth started swimming in and drinking from the many streams and rivers that crisscross the continents. As civilization developed along the waterways, the amount of waste materials dumped into the water became sufficient to cause pollution. In many parts of the world society is gradually learning how to deal with this pollution in order to maintain reasonable standards of water quality.

Environmental issues are expected to become extremely important during the next 10 year period. Agriculture will receive special attention due to at least in part the large quantities of chemical fertilizers, herbicides, and other pesticides that are applied to agricultural land. The nursery and greenhouse industry is closely aligned with general agriculture and will come under the same, if not greater scrutiny, as general agriculture, due to the physical location of the operations. Unfortunately, farmers are now only a small percentage of the population of industrialized countries and consequently they are losing their political clout. It is now more important than ever for people involved in agriculture to be aware of the legislation that affects their industry and to question public comments that are being voiced on the agricultural issues.

Most nursery and greenhouse operations represent very intense agricultural systems. The crop value per acre is much higher than general agriculture and the use of agricultural chemicals is also much greater. This has resulted in some operations being identified

as point source polluters. This potential will become increasingly great as new legislation is passed and enforcement of existing legislation is intensified.

The latest concept that has worldwide attention is the idea of sustainable systems. These are defined as systems that can be continued for extended periods of time without having a detectable effect on the environment. Systems of this type will need to become the goal of every grower.

Ground water contamination is presently of great interest. With the present analytical equipment, it is possible to detect extremely small quantities of contaminants present in the water taken from test wells. Nitrates in the ground water have been a concern for many years but now measurable amounts of herbicides and insecticides are also being found in some areas. In California this has led to restrictions on the use of these chemicals in the areas where they are showing up in the ground water.

In nursery and greenhouse operations the waste water from irrigation and fertilization programs represents the major source for potential ground water contamination. This water may also pick up other agricultural chemicals applied to the soil or the crops. In many operations the runoff water may exceed 50% of the volume of water applied to the crop. Since it is not practical at this time to completely eliminate the use of chemicals on the horticultural crops, the potential for a contamination of the ground water must be minimized by more prudent use of the irrigation water. This will involve more efficient irrigation programs including recycling systems.

Recycling can be accomplished in a variety of ways with one of the more popular at this time being the ebb & flow system which is currently widely used throughout Europe. With this system, the potted plants are placed in a water tight tray and sub-irrigated with a fertilizer solution. All of the water that is not taken up by the plants during the irrigation is drained back into a holding tank where the conductivity of the solution is monitored and then adjusted to provide the crop with a consistent fertilizer program. These systems can be completely automated and are becoming more popular in areas where it is necessary to conserve water or to control runoff.

With a system of this type considerable saving in both water and fertilizer use is realized and where no water is applied to the leaf surface of the plant fewer chemicals are needed to control foliar disease problems. The salinity buildup that occurs with sub-irrigation has not been a problem on short term crops and there does not seem to be any unusual increase in root disease problems with the system. Initially the runoff water needs to be analyzed to

evaluate changes in the chemical composition that occur as the water is recycled. These changes will vary depending upon the starting chemistry of the water, the fertilizer additions, and the dimensions of the system.

Greenhouse growers now have the capability of nearly eliminating runoff with systems such as the ebb & flow method of irrigation. More widespread use of systems of this type is inevitable as the environmental emphasis forces the grower to become more responsible for the waste generated by his business. At this time, it is important for all growers to take an active part in both waste management and developing the environmental legislation that will control the horticultural industry in the future. Without this involvement, legislation which will cripple production, is inevitable.

RICHARD BOSLEY: Does your firm design these systems?

JOHN RODEBAUGH: No, just monitor them.